

Graph $y = a(x + h)^2 + k$

Date: _____

In General:

$$y = a(x - h)^2 + k$$

**-Vertical Stretch or
Compression
-Opens Up or Down**

**-Horizontal Translation
Left or Right**

**-Vertical Translation
Up or Down**

Vertex (h, k)

Axis of Symmetry $x=h$

Maximum or Minimum value is k.

EX: Describe the properties and graph and label it fully for:

A. $y = -2(x + 3)^2 + 8$

B. $y = \frac{1}{2}(x - 4)^2 - 3$

EX: Find the equation of the parabola with vertex (5, -2) and passing through the point (3, -18).

EX: The quadratic relation $h = -0.07(d - 10)^2 + 8$ shows the height of a baseball, h metres, as a function of the horizontal distance from home plate, d metres, the baseball travels after a batter hits it.

- A.** Sketch the flight of the baseball.

- B.** What is the maximum height of the ball?

- C.** What is the horizontal distance of the ball from home plate when it reaches its maximum height?

- D.** What is the height of the ball when it is hit?

- E.** If the ball was caught 19.5m from home plate, how far off the ground was the glove when the ball was caught, to the nearest tenth of a metre?

- F.** If no one had caught the ball, what would its horizontal distance from home plate have been when it hit the ground, to the nearest tenth of a metre?